

13. STATUTORY DETERMINATIONS

13.1 CFA-04 Pond

13.1.1 Protection of Human Health and the Environment

The selected remedy for CFA-04 Pond—excavation and disposal of mercury-contaminated soil to an approved facility at INEEL—provides highly effective, long-term protection of human health and the environment. The selected remedy most cost-effectively meets the threshold and balancing criteria of the three remedies considered. The removal of the mercury-contaminated soil from CFA-04 will eliminate potential short-term and long-term human health and environmental threats. The ICDF will provide isolation of the contaminated soil and prevent adverse effects to human health or the environment.

13.1.1.1 Compliance with ARARs. The selected remedy will be designed to comply with all action-specific and location-specific federal and state ARARs as listed in Table 13-1. The selected remedial design will achieve the FRG of 0.50 mg/kg for mercury. This represents 10 times the background concentration of mercury. Available data indicate that approximately 612 m³ (800 yd³) of soil to be excavated from CFA-04 contain levels of leachable mercury above the RCRA characteristic hazardous waste levels. This soil will be treated prior to disposal to meet applicable RCRA land disposal restriction treatment standards. All applicable emission control standards shown in Table 13-1 will be met during the excavation and disposal of the soil. Applicable provisions of Department of Energy Order 5400.5, *Radiation Protection of the Public and the Environment* will be met. The selected remedy will comply with all ARARs.

13.1.2 Cost-Effectiveness

Cost-effectiveness is a determination of whether the cost of a remedy is proportional to the overall effectiveness of the remedy. The long-term effectiveness is rated as high because mercury-contaminated soil will be permanently removed and disposed of to a RCRA-compliant facility. The portion of the soil that exceeds RCRA characteristic hazardous waste levels will be treated by stabilization with cement to achieve land disposal restrictions. A reduction in mobility for that portion of the contaminated soil will be achieved. The short-term effectiveness is moderate because some workers may be exposed to contaminated soil during excavation. Off-INEEL disposal could be implemented sooner than on-INEEL disposal. However, the costs would almost double if off-site disposal is required. The selected remedy is the most cost-effective alternative.

13.1.3 Use of Permanent Solutions and Alternative Treatment Technologies

The selected remedy uses a permanent solution to the maximum extent practicable. Treatment through stabilization with cement will be used for that portion of the soil that exceeds the TCLP standard for mercury. The mobility of mercury in CFA-04 soil above the FRG will be reduced by placement in an approved disposal facility. Mercury-contaminated soil above the FRG will be permanently removed from the CFA-04 Pond and disposed in an approved facility, thereby eliminating human and environmental exposure. This alternative will prove to be very effective in the long term and provides the best balance between long-term effectiveness and permanence.

13.1.4 Preference for Treatment as a Principal Element

Alternatives incorporating ex situ treatment of the mercury-contaminated soil do not significantly increase the long-term effectiveness, permanence, or protection of human health and the environment

Table 13-1. ARARs and TBCs for the selected remedies for CFA-04, CFA-08, and CFA-10.

Category	Citation	Reason	Relevancy ^a
Action Specific ARARs			
Rules for the Control of Air Pollution in Idaho	Toxic Air Emissions (IDAPA 16.01.01.585 and .586)	The release of carcinogenic and noncarcinogenic contaminants into the air must be estimated before the start of construction, controlled, if necessary, and monitored during excavation and sorting of soil.	A
	Fugitive Dust (IDAPA 16.01.01.650 and .651)		
National Emission Standards for Hazardous Air Pollutants	Radionuclide Emissions from DOE Facilities (40 CFR 61.92)	Requires control of dust during excavation and removal of soil.	A
	Emission Monitoring (40 CFR 61.93)	Limits exposure of radioactive contamination release to 10 mrem/year for the off-Site receptor and establishes monitoring and compliance requirements.	A
Resource Conservation and Recovery Act—Standards Applicable to Generators of Hazardous Waste	Hazardous Waste Determination (IDAPA 16.01.05.006) (40 CFR 262.11)	A hazardous waste determination is required for the soil and any secondary waste generated during remediation. Not an ARAR for CFA-08.	A
	Temporary Units IDAPA 16.01.05.008 (40 CFR 264.553)	Applies to temporary (<1 year) storage or treatment units.	A
	Remediation waste staging piles IDAPA 16.01.05.008 (40 CFR 264.554)	Excavated soils can be temporarily stage prior to disposal.	A
	Storm water discharges during construction 40 CFR 122.26	Will be met during excavation and disposal through engineering controls.	A
	Land disposal restrictions (LDR) IDAPA 16.01.05.011 (40 CFR 268)	Applies only to soils that have triggered placement. Not for CFA-08.	A
	Alternative LDR treatment standards for contaminated soils IDAPA 16.01.05.011 (40 CFR 268.49)	Applies only to soils that have triggered placement, not for CFA-08.	A

Table 13-1. (continued).

Table 15-1. (Continued).			
Category	Citation	Reason	Relevancy ^a
Chemical-specific	Closure and Post Closure Care of Landfills 40 CFR 264.310(a)(1-5)	Although waste in CFA-08 is not RCRA hazardous, the design and maintenance for soil cover will be followed.	B
	Hazardous waste characteristics identification IDAPA 16.01.05.005 (40 CFR 261.20–24)	Applies if the soils are excavated and consolidated to facilitate their management and for soils that are treated or placed in a long-term storage unit.	A
Location-Specific ARARs			
National Historic Preservation Act	Historic properties owned or controlled by Federal Agencies (16 USC 4691.2)	The site must be surveyed for cultural and archeological resources before construction and for appropriate actions taken to protect any sensitive resources.	A
	Identifying Historic Properties (36 CFR 800.4)		A
	Assessing Effects (36 CFR 800.5)		A
Native American Graves Protection and Repatriation Act	Custody (25 USC 3002)	The site must be surveyed for cultural and archeological resources prior to construction and for appropriate actions taken to protect any sensitive resources.	A
	Repatriation (25 USC 3005) (43 CFR 10.10)		A
To-be-considered (TBC) guidance			
Radiation protection of the Public and the Environment for CFA-08 only.	(DOE Order 5400.5, Chapter II [1][a,b])	Limits the effective dose to the public from exposure to radiation sources and airborne releases.	B
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a. Relevancy: A = Applicable B = TBCs are not classified as applicable or relevant and appropriate. LDR – Land Disposal Restrictions			

than removal and disposal alone. These methods are also more expensive. Treatment is only required for the portion of soil with mercury concentrations in excess of the RCRA characteristic hazardous waste levels for land disposal. The statutory preference for treatment is achieved to the maximum extent practicable.

13.1.5 Five-Year Reviews

Because this remedy will remove hazardous substances and contaminants above levels that allow for unlimited use and unrestricted exposure, five-year statutory reviews will not be required.

13.2 CFA-08 Sewage Plant Drainfield (OU 4-08)

13.2.1 Protection of Human Health and the Environment

The selected remedy for the CFA-08 SP Drainfield—containment of cesium-137-contaminated soil through capping—provides effective, long-term protection of human health and the environment. The selected remedy most cost-effectively meets the threshold and balancing criteria of the three remedies considered. It effectively isolates the contaminated soil and breaks the external exposure pathway in both the short- and long-term. Natural radioactive decay is projected to reduce the cesium-137 concentrations to levels that do not pose an unacceptable risk to human health and the environment in 189 years.

13.2.1.1 Compliance with ARARs. The selected remedy will be designed to comply with all action-specific and location-specific federal and state ARARs as listed in Table 13-1. Available data indicate that no RCRA contaminated media are present at the CFA-08 drainfield. All applicable emission control standards shown in Table 13-1 will be met during the construction. DOE Order 5400.5, “Radiation Protection of the Public and the Environment,” (DOE, 1990) will be met by implementing and enforcing applicable provisions of that order. Therefore, the selected remedy will comply with all ARARs.

13.2.2 Cost-Effectiveness

Cost-effectiveness is a determination of whether the costs of a remedy are proportional to the overall effectiveness of the remedy. The long-term effectiveness of capping the drainfield is rated as high because it would break the external exposure pathway until the human health risks from cesium-137 fall below threshold levels. The short-term effectiveness is moderate, because although the risks from direct exposure will be reduced in the near future, some workers potentially will be exposed to contaminated soil during construction. Although the containment remedy is approximately twice as expensive as the Limited Action (institutional control) alternative, the long-term effectiveness is greater because capping will prevent external exposure from cesium-137 during the calculated 189-year timeframe required for levels to fall below acceptable risk levels. Therefore, the selected remedy is the most cost-effective alternative.

13.2.3 Use of Permanent Solutions and Alternative Treatment Technologies

This selected remedy uses a permanent solution to the maximum extent practicable. The engineered cap is projected to be effective over the 189-year timeframe until natural radioactive decay of cesium-137 causes concentrations to fall below acceptable exposure levels. Therefore, this remedy achieves a high degree of long-term effectiveness. After 189 years, the remedy can be considered to be permanent because radiation from cesium-137 will no longer pose an unacceptable risk to human health.

13.2.4 Preference for Treatment as a Principal Element

This remedy does not use treatment to reduce toxicity, mobility or volume for the following reasons. Natural radioactive decay is the only means to reduce the toxicity of radionuclides. Reduction in mobility is not applicable because the risk from the cesium-137 contaminated soil is from external exposure. Other attempts to reduce the volume of radionuclide-contaminated soil through physical separation have not been successful at the INEEL.

13.2.5 Five-Year Reviews

ICs consisting of monitoring, access restriction, and runoff-control technologies will be used as a part of this remedy. Therefore, five-year statutory reviews will be required for this remedy.

13.3 CFA-10 Transformer Yard (OU 4-09)

13.3.1 Protection of Human Health and the Environment

The selected remedy for the CFA-10 Transformer Yard—excavation, treatment and disposal of lead-contaminated soil at an off-site facility—provides highly effective, short- and long-term protection of human health and the environment. The selected remedy most cost-effectively meets the threshold and balancing criteria of the remedies considered. The removal of the lead-contaminated soil from CFA-10 will eliminate potential short-term and long-term human health and environmental threats. A permitted off-site disposal facility will provide isolation of the contaminated soil and prevent exposure to humans or the environment.

13.3.1.1 Compliance with ARARs. This selected remedy will be designed to comply with all the action-specific and location-specific federal and state ARARs listed in Table 13-1. The selected remedial design will achieve the FRG of 400 mg/kg of lead in soil remaining on site. Excavated soil with lead concentrations exceeding 5 mg/L TCLP will be stabilized with cement prior to disposal. All applicable emission control standards will be met during the excavation and disposal of the soil (DOE-ID 1999a). Therefore, the selected remedy will comply with all ARARs.

13.3.2 Cost-Effectiveness

Cost-effectiveness is a determination of whether the costs of a remedy are proportional to the overall effectiveness of the remedy. The long-term effectiveness is rated as high because lead-contaminated soil will be permanently removed and disposed to an approved, permitted off-INEEL facility. The short-term effectiveness is moderate in that some workers potentially will be exposed to contaminated soil during excavation. The selected remedy is slightly more expensive than the on-INEEL disposal alternative (\$1.4 million vs. \$1.3 million, respectively). However, off-INEEL disposal can be implemented sooner because the ICDF will not be operational until 2004. Therefore, the selected remedy is the most cost-effective alternative.

13.3.3 Use of Permanent Solutions and Alternative Treatment Technologies.

This selected remedy uses a permanent solution to the maximum extent practicable. Treatment through stabilization with cement, of CFA-10 soil with TCLP concentrations greater than 5mg/kg, will reduce the mobility of lead. Lead-contaminated soil exceeding the FRG will be permanently removed from the CFA-10 Transformer Yard and disposed of at an approved off-INEEL facility, thereby

eliminating human and environmental exposure. This alternative will prove to be very effective in the long-term and provides the best balance between long-term effectiveness and permanence.

13.3.4 Preference for Treatment as a Principal Element

The statutory preference for treatment through reduction in toxicity, mobility, or volume is met to the maximum extent practicable with the selected remedy. Soil exceeding the lead FRG of 400 mg/kg and the lead TCLP limit of 5 mg/L will be excavated, stabilized with cement to reduce mobility, and disposed of in an off-INEEL facility. No treatment technologies exist to reduce the toxicity or volume of lead-contaminated soil. Therefore, the statutory preference for treatment is achieved to the maximum extent practicable.

13.3.5 Five-Year Reviews

Because this remedy will remove hazardous substances and contaminants above levels that allow for unlimited use and unrestricted exposure, five-year statutory reviews will not be required.

14. DOCUMENTATION OF SIGNIFICANT CHANGES

14.1 Modification of the Preferred Alternative for CFA-08

Alternatives 3a and 3b for the CFA-08 Sewage Plant Drainfield use SGS as the treatment option in the Proposed Plan. The SGS was proposed to reduce the volume of contaminated soil disposed to on- or off- INEEL locations by ex situ separation. A treatability study on SGS was performed by WAG 5 in 1999 (DOE-ID 1999b). The results of the study indicate that cesium-137 contaminated soil at WAG 5 cannot be successfully sorted to satisfy the 2.3 pCi/g FRG for cesium-137 with any volume reduction. As a result, Alternatives 3a and 3b are shown without treatment and the preferred remedy is Alternative 4.

14.2 CFA-04 Information

Table 3 on page 11 and Table 7 on page 1 of the Proposed Plan indicate that the human health hazard index for mercury is 62 at CFA-04. The calculated HQ is 80 as shown in Appendix D, Table D-46 of the RI/FS (DOE-ID 1999a). The values in the Proposed Plan were taken from Section 7 of the RI/FS, which was not updated to reflect the calculated risk values prior to finalization.

Table 3 also shows the FRG for mercury at CFA-04 is 0.74 mg/kg, when it is reported in this ROD as 0.5 mg/kg. The 0.5 mg/kg number represents the average background concentration for composited samples, whereas 0.74 mg/kg is the average background for discrete samples. Because the samples will be composited for analysis during remediation of the pond, 0.5 mg/kg is the appropriate FRG.

The cost estimate for the selected remedy at CFA-04 was \$6.9 million NPV in the RI/FS and the Proposed Plan, whereas the estimated cost in this ROD is shown in Table 12-3 as \$4.8 million NPV. The cost estimate in this ROD is lower because costs have been recalculated and ICDF disposal costs that will be borne by WAG 3 have been eliminated from the CFA-04 cost estimate. (These modifications are documented in DOE-ID 2000d.)

The Proposed Plan states that Alternative 3b, off-INEEL disposal would be the contingent remedy if the ICDF is not operational. By remediating CFA-04 last (CY-03), it is believed that the ICDF will be operational for disposal of the contaminated and stabilized soil.

14.3 OU 4-13A Interim Action Proposed Plan

The Proposed Plan for this ROD was titled the OU 4-13A Interim Action Proposed Plan. The following paragraphs explain the naming differences between the OU 4-13 RI/FS, the OU 4-13A Interim Action Proposed Plan, and this OU 4-13 Comprehensive ROD. These changes are a logical outgrowth of the Proposed Plan and other documents in the AR.

Although no unacceptable risks were identified in the OU 4-13 RI/FS via groundwater use at WAG 4, a subsequent report for the OU 4-12 Post-ROD monitoring program identified that nitrate in two wells at WAG 4 was above a federal drinking water MCL of 10 mg/L. On this basis, the Agencies initially decided to separate OU 4-13 into two investigations: OU 4-13A was designated as an Interim Action ROD, and OU 4-13B, which was planned as the groundwater RI/FS. Therefore, the Proposed Plan for the OU 4-13 investigation was retitled the OU 4-13A Interim Action Proposed Plan when it was issued in August 1999.

Subsequent to this decision, information was gathered regarding the likely source and extent of nitrate in the wells. Additionally, a higher allowable level for nitrate was identified in the Federal Regulations that apply when the water is not available to infants under 6 months of age. The average nitrate concentration in one of the subject wells is equal to the MCL; nitrate concentrations in the other

well are less than the allowable MCL and show a downward trend. On that basis, the Agencies decided to eliminate the OU 4-13B RI/FS and maintain the original name, which is the OU 4-13 Comprehensive ROD. Groundwater will continue to be evaluated under the OU 4-12 Post-ROD monitoring program.

14.4 Ecological Sites and Risks

On page 8 of the proposed plan, sites that were retained for cumulative site-wide investigation are listed as CFA-01, CFA-02, CFA-05, CFA-13, CFA-17, CFA-21, CFA-26, CFA-41, CFA-43, and CFA-47. The sites retained for further evaluation are CFA-01, CFA-02, CFA-05, CFA-13, CFA-41, and CFA-43, based on further screening of contaminants with HQ less than 10.

On page 7 of the proposed plan, the maximum acceptable level of copper and lead for CFA-10 was listed as 320 and 400 respectively. The maximum acceptable level, or 10 times background values, listed in the RI/FS are 220 and 170 respectively.

15. REFERENCES

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- 10 CFR 835, *Code of Federal Regulations*, Title 10, "Energy," Part 20, "Standards for Protection Against Radiation."
- 36 CFR 800.4, *Code of Federal Regulations*, Title 36, "Parks, Forests and Public Property", Part 800, "Protection of Historic Properties", "Identification of Historic Properties".
- 40 CFR 61, *Code of Federal Regulations*, Title 40, "Protection of the Environment," Part 61, "National Emission Standards for Hazardous Air Pollutants."
- 40 CFR 141, *Standards for Protection of the Environment*, "National Primary Drinking Water Regulations," Code of Federal Regulations.
- 40 CFR 143, *Standards for Protection of the Environment*, "National Secondary Drinking Water Regulations," Code of Federal Regulations.
- 40 CFR 262.11, *Code of Federal Regulations*, Title 40, Protection of the Environment, Part 262, "Standards Applicable to Generators of the Hazardous Wastes," Subpart 11, "Hazardous Waste Identification."
- 40 CFR 264.13, *Code of Federal Regulations*, Title 40, Protection of the Environment, Part 262, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," Subpart 13, "General Waste Analysis,"
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